

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

TITLE V (DRAFT PERMIT) NO. V-04-021

AHLSTROM ENGINE FILTRATION, LLC

MADISONVILLE, KY

JUNE 30, 2004

JOSHUA J. HIGGINS, REVIEWER

PLANT I.D. # 21-107-00028

APPLICATION LOG # 51224/54573

**SOURCE DESCRIPTION:**

Ahlstrom Engine Filtration, LLC, owns and operates a paper filter manufacturing facility in Madisonville, KY. Based on customer needs, the paper making process begins with mixing wood pulp, cotton linters pulp, glass fibers, or polyester fibers with water in the paper machines hydropulper. These raw materials are shipped onto the facility and stored in a warehouse until needed (i.e., not manufactured by Ahlstrom). The wet slurry from the hydropulper is passed through a series of screens and metal drums to produce a wide single continuous sheet of paper at a specified thickness. The paper is dried using hot drums and a Honeycomb Through-Air Dryer (TAD). The paper is passed through a resin saturator containing an alcohol-resin mixture that contains hazardous air pollutants (HAPs). The coated paper is wound onto a spool and hung in the mull rack for several hours to allow the solvent to penetrate and saturate the paper fibers. Once saturated, the paper is unwound and passed through a predryer and the cure oven to cure and volatilize remaining organic solvents. The hot, dry paper is then rewound onto another spool and allowed to cool in preparation for cutting to customer specifications. The finished product is stored in a warehouse until ready for shipment.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

**APPLICATION COMMENTS:**

Title V, Log # 51224/54573

**COMMENTS:**

Ahlstrom purchased the facility at Madisonville in April 1989 from Southern Specialty/Knowlton Brothers. Prior to Ahlstrom's ownership, KDAQ and the facility received complaints regarding odor. KDAQ inspectors revealed that the incinerator used to control VOC emissions was not operating at the temperature required by the facility's permit condition to maintain an 85% VOC emission reduction. In July 1989, Ahlstrom purchased and installed a more efficient oxidizer designed for 95% VOC removal and destruction.

The initial Title V application submittal received December 20, 1999 indicated that Ahlstrom was still determining PSD applicability with some projects that had occurred at the facility in the past. Apparently, a meeting was held May 8, 2000 between Ahlstrom and the Division to determine the PSD applicability of the past projects. The resultant PSD applicability analysis is included with the additional information packets received on May 12, 2000 and November 20, 2000. They indicate that the potential to emit criteria pollutants from all projects associated with Ahlstrom did not trigger a PSD review (See the December 6, 2000 letter from the Division to Mr. Herman W. Moore III of Ahlstrom included in the additional information section of the application packet).

The major emission points that emit VOCs are the paper saturator, mull rack, unwind station, and ovens section. VOCs are collected by a vacuum system that pulls air from an enclosure surrounding the saturator and ovens section. The mull rack and unwind station, however, do not have an enclosure and therefore all VOCs are emitted fugitively. Ahlstrom, however, is in the process of developing a means to capture emissions from the Mull Rack (See "Anything unusual about the response to source testing proposal," below). These fugitives are not considered for PSD applicability because the source is not one of the listed source categories. VOCs drawn from the saturator and ovens are burned in the Reeco oxidizer. The flue gas from this oxidizer is proportionally sent to a heat recovery boiler used to generate steam for the papermaking process. Exhaust from this boiler can also be used upstream for heat.

The paper making process consists of an 8760 hour per year operation as indicated by the Notice of Deficiency response letter received February 16, 2004. Potential emissions were calculated based on 8760 hours for all sources of emissions except the Joy Incinerator. Operational limits pertaining to the Joy Incinerator from permit number C-92-053 were carried over to the Title V permit. As such, operation of the incinerator is limited to a maximum charging rate of 1000 lb/hr and 2304 tpy. Potential emissions from the Joy Incinerator were based on the 2304 tpy maximum charging rate.

On April 9, 2002, the facility submitted a Phase I MACT Hammer application and minor revision (Log # 54573) that was combined with the Title V application. This package indicated that Ahlstrom intends to comply with 40 CFR 63 Subpart JJJJ, *NESHAP for Paper and Other Web Coating*, and included relocating Research and Development activities from a Chattanooga, TN facility to the Madisonville facility. The Research and Development activities were added to the permit as an Insignificant Activity. According to 40 CFR 63 Subpart JJJJ, the compliance date for existing affected facilities is no later than December 5, 2005 (40 CFR 63.3330(a)), and the deadline for initial notification is no later than December 5, 2004 (40 CFR 63.3400(b)(1) & (3)). The permit will have to be revised at that time to incorporate the requirements from this rule based on the source's requests in the initial notification.

Type of control and efficiency:

Type: Thermal Oxidizer

Model: E-45000

Manufacturer: Reeco

Primary Fuel: Natural Gas. Secondary Fuel: None.

Rated capacity: 30 mmBtu/hr (two 15 mmBtu/hr Max Burners)

Date constructed: 1989

Emission factors and their source:

A combination of AP-42 emission factors, engineering calculations, site testing, and TANKS 3.1 output were used to estimate emissions in the application. The TANKS output was included with the initial Title V submittal received December 20, 1999. The source was not required to update the output to TANKS 4.0 because the application was deemed complete on February 18, 2000 by regulatory default, and emissions from each tank qualify as insignificant activities. Updating the emissions using TANKS 4.0 was not expected to produce a notable difference.

Applicable regulations:

Note: Only specific regulations have been listed here, no generally applicable regulations are listed.

401 KAR 59:015, *New indirect heat exchangers*, applies to the C.E. Water Tube Boiler, the Honeycomb Through-Air Dryer, and the Reeco Thermal Oxidizer.

401 KAR 59:020, *New incinerators*, applies to the Joy Incinerator.

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, applies to the C.E. Water Tube Boiler, the Honeycomb Through Dryer, and the Reeco Thermal Oxidizer.

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart DDDD, *Emissions Guidelines and Compliance Times for Commercial and Industrial Solid Waste Incineration Units that Commenced Construction On or Before November 30, 1999*, applies to the Joy Incinerator. Final compliance, however, is not required until three years after development of a State Plan. Since Subpart DDDD (and the "Model Rule" which is used as the State Plan) was incorporated on March 18, 2002, final compliance is required by March 18, 2005.

401 KAR 61:120, *Existing fabric, vinyl and paper surface coating operations*. Ahlstrom voluntarily complies with this regulation, and its requirements were added to the Paper Coating Operations. Typically this regulation would not apply to the Paper Coating Operations because the source is located in Hopkins County which is considered attainment for ozone.

401 KAR 63:020, *Potentially hazardous matter or toxic substances*, applies to the Paper Coating Operations.

401 KAR 63:021, *Existing sources emitting toxic air pollutants*, applies to the Paper Coating Operations. See "Anything unusual about the 401 KAR 63:021 Applicability and Requirements," below.

40 CFR 63, Subpart JJJJ, *NESHAP for Paper and Other Web Coating*, applies to the emissions from the Saturator, Mull Rack, Pre-Dryer, and Cure Oven. See “Anything unusual about the response to source testing proposal,” below. However, compliance is not required until December 5, 2005, and the specific requirements based on this regulation are not yet listed in the permit.

Anything unusual about the:

1) Emission point number and description.

Group 2, Boilers, consists of all process units that meet the definition of an “indirect heat exchanger” as defined in 401 KAR 59:015. Since the exhaust heat from the Reeco Thermal Oxidizer is directed to the process line, it meets this definition. The requirements for use of the Reeco Thermal Oxidizer as a control device for the Paper Coating Operations are included with Group 1, but its heat input capacity was included in the “total rated heat input capacity of all affected facilities” [401 KAR 59:015, Section 3(1)] within the source for determining emission limits for the Boilers.

2) Regulations that are not applicable.

- 401 KAR 59:210, *New fabric, vinyl and paper surface coating operations*, does not apply to the Paper Coating Operations because the paper coating facility was constructed in 1974 which is prior to the effective date of this regulation.
- 40 CFR 60 Subpart E, *Standards of Performance for Incinerators*, does not apply to the Joy Incinerator because it is limited to a maximum loading capacity of 1000 lbs/hour (12 tons per day) which is well below the 50 tons per day threshold of this regulation.
- 40 CFR 63 Subpart S, *NESHAPs from the Pulp and Paper Industry*, does not apply to this facility because there is no bleaching or mechanical pulping process. The source produces paper from dry pulp that is shipped in.
- 40 CFR 63 Subpart MM, *NESHAPs from the Pulp and Paper Industry*, does not apply to this facility because the source does not produce pulp by any process addressed in this section.

3) 401 KAR 63:021 Applicability and Requirements.

Ahlstrom was issued permit number O-88-066 on November 17, 1988, which contained requirements and limitations on formaldehyde, methanol, and phenol emissions based on the version of 401 KAR 63:021 with an effective date of November 11, 1986. This regulation was rewritten January 19, 1999, and currently states that existing sources which were issued a permit pursuant to 401 KAR 50:035 with conditions based on the previous version of 401 KAR 63:021 shall continue to comply with those requirements unless the source can demonstrate that a condition is no longer necessary. Through submittal of the Title V application, Ahlstrom has shown that the O-88-066 limitations for methanol (5126 lb/hr and 17,331 tpy) and phenol (374.4 lb/hr and 1,266 tpy) are “no longer necessary to protect human health and the environment.” [401 KAR 63:021, Section 1] This is due to the fact that the uncontrolled and controlled emissions of methanol and phenol are 9669.63 tpy and 518.27 tpy, and 446.26 tpy and 18.39 tpy, respectively. Since the source’s maximum potential emissions of methanol and phenol are already well below the O-88-066 limits, common sense indicates that carrying these limits over to the Title V permit will not provide any protection to human health or the environment, and, therefore, are no longer necessary. In this case, until compliance with

40 CFR 60 Subpart JJJJ is required, applying 401 KAR 63:020 requirements is the only way to ensure the emissions of methanol and phenol are not emitted "...in such quantities or duration as to be harmful to the health and welfare of humans, animals and plants." [401 KAR 63:020, Section 3]. See the "SCREEN3 Modeling" discussion below.

Operating limitations and requirements from O-88-066 for formaldehyde, however, were carried over to the Title V permit. Based on the previous version of 401 KAR 63:021, Reasonably Available Control Technology (RACT) was required for formaldehyde emissions, and use of the incinerator installed at the time was considered RACT. This decision was based on information in the application associated with permit number O-88-066 that showed an incinerator efficiency of 91.5%. Use of the current incinerator as RACT with a destruction efficiency of 91.5% has been carried over into the Title V permit. However, test results for the current incinerator included with the Title V application indicate a destruction efficiency for formaldehyde of only 50.09%, nor does it specify the capture efficiency of the vacuum system currently in use. In order to verify formaldehyde destruction efficiency the source's consultant proposed that NCASI Method CI/WP-98.01, "Chilled Impinger Method for use at Wood Products Mills to Measure Formaldehyde, Methanol, and Phenol," be used. The Division agreed based on the fact that the proposed method has been validated pursuant to the requirements of 40 CFR 63, Appendix A, Method 301, "Field Validation of Pollutant Measurement Methods from Various Waste Media." Therefore this method was specified in the Paper Coating Operations testing section to determine the Formaldehyde destruction efficiency of the Reeco Thermal Oxidizer.

#### 4) SCREEN3 Modeling.

Due to the fact that there are differences in the formaldehyde control efficiency from the past incinerator to the current incinerator, and because of the fact that the potential emissions of methanol and phenol are still high, additional testing and modeling requirements were added to the permit in order to verify the incinerator destruction efficiency and ensure that the emissions of potentially hazardous matter or toxic substances from the Paper Coating Operation are not emitted "...in such quantities or duration as to be harmful to the health and welfare of humans, animals and plants." [401 KAR 63:020, Section 3] In an attempt to determine the concentration of air toxic emissions in the vicinity of the source, the Division conducted multiple SCREEN3 modeling runs for formaldehyde, methanol, phenol, and triethylamine emissions. These pollutants were selected for modeling because the controlled PTE of each pollutant is either above or very close to 10 tpy. U.S. EPA Region IX recommended Preliminary Remediation Goal (PRG) values were used as a screening tool to compare with modeled emission rates to show that "further evaluation of the potential risks that may be posed by site contaminants is appropriate." [U.S. EPA Region IX website describing how PRG's are used] For methanol, phenol, and triethylamine, the modeled concentrations are below the U.S. EPA Region IX recommended PRG values. For formaldehyde, the concentrations from two runs exceed the PRG value. The third run for formaldehyde results in modeled concentrations that are below the PRG value.

In order to use SCREEN3, however, many assumptions and corrections to the data supplied in the application were made. Some of the assumptions produce less conservative results, which means the modeled concentration is probably lower than the actual concentration. Additionally, the assumptions dealing with formaldehyde coating

retention need to be verified by the source. See Appendix A – D of this section for a detailed description of the assumptions and corrections to supplied data used for SCREEN3 modeling, development of the modeled emission rates, output from each modeling run, and copies from the U.S. EPA Region IX PRG Table.

Modeled Output Summary:

<b>Pollutant &amp; Modeled Emission Rate (g/sec)</b>	<b>1-hr Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Corrected Annual Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Region IX PRG Value (<math>\mu\text{g}/\text{m}^3</math>)</b>
Formaldehyde, 1.19 (Run 1)	13.98	1.12	0.15
Formaldehyde, 0.6 (Run 2)	7.047	0.56	0.15
Formaldehyde, 0.09 (Run 3)	1.057	0.08	0.15
Methanol, 14.91	175.1	14.0	1800
Phenol, 0.53	6.224	0.5	2200
Triethylamine, 0.26	3.054	0.24	7300

5) Response to source testing proposal.

On April 27, 2004, while the draft permit was undergoing Section Chief review, Ahlstrom submitted a source testing proposal based on a pre-draft “courtesy copy” of the permit. Since the proposal was received before draft permit issuance, it will be addressed now rather than waiting until the typical Response to Comments conducted after the public comment period. The source’s proposal and the Division’s response follow.

Source Proposal:

The mill is simultaneously reviewing the requirements of the draft Title V permit and MACT Standard for Paper and Other Web Coating Standards (40 CFR Part 63 Subpart JJJJ). In evaluating the source testing requirements under these requirements there is an apparent conflict between the two, requiring a duplication of source test efforts.

By way of an example, currently, the draft Title V permit requires that the capture and destruction efficiency of the paper coating line be completed within 60 days of issuance; however, the MACT standard, Subpart JJJJ, requires compliance by December 2005. Based on these separate schedules, two source test events will be required. Additionally, there is a discrepancy in the sources or emissions points that will be covered by the MACT standard. Specifically, the definition of a coating line differs between the State requirements and the MACT standard.

The underlying requirement in the draft Title V Permit requires 85% overall control of VOC emissions from the coating line. The MACT standard requires 95% overall control of HAP emissions. However, compliance with the MACT standard will be demonstrated based on testing the control of VOC emissions. Therefore, compliance with the MACT

standard will ensure compliance with the existing 85% control efficiency requirement.

Given the two separate schedules for testing and the conflicting sources, Ahlstrom is proposing that the testing be combined in one test program following the testing schedule required by the MACT standard. By doing this, it will reduce the redundancy in testing and determine compliance for both requirements. The streamlining of the testing requirements between the two standards would save substantial time, effort and money for both the state and Ahlstrom.

Please consider this proposal and let me know if this proposal is conceptually acceptable. If acceptable, Ahlstrom will prepare a test plan and protocol (TPP) to fully describe the testing and propose revised draft language for the Title V permit to eliminate discrepancies in the testing requirement. If preferred by KDEP, Ahlstrom is willing to meet with KDEP to discuss this in detail prior to preparing the TPP and proposed permit revisions.

*Division's Response: The proposal identifies two separate testing requirements/timelines in the draft - one based on State requirements (in this case 401 KAR 63:020 and 63:021), and one based on the MACT standard (40 CFR 63 Subpart JJJJ). There are, in fact, two distinct testing timelines, but they are not conflicting requirements. One set of requirements is meant to meet the State requirements and the other is meant to meet JJJJ requirements. The Division wants to be assured of compliance immediately regarding 63:020 and 63:021 (hence the permit requirements for testing NLT 60 days after proposed permit issuance). Regarding JJJJ, the Division can't justify making the source test earlier than the MACT standard specifies (which is within 180 days of the compliance date), so the suspense for those test requirements were included separately in the compliance schedule section.*

*The source proposal requests that the testing be combined in one test program following the MACT standard testing schedule. The Division agrees that one test can be arranged to meet both the State and MACT requirements, but the tests can't wait until the suspense given in the MACT standard (again, compliance with 63:020 and 63:021 must be demonstrated immediately). Therefore, there appear to be two options: 1) conduct two separate tests following the separate schedules (as presented in the draft permit), or 2) conduct one test following the schedule established pursuant to 63:020 and 63:021, but also including all testing requirements from the MACT.*

*The source proposal also mentions that there is a difference between the definitions of "coating line" presented in 401 KAR 61:120 and "web coating line" from subpart JJJJ, and that demonstrating compliance with the MACT standard would also demonstrate compliance with 61:120. The Division consulted with Leonardo Ceron, U.S. EPA Region IV, Air Toxic Assessment and Implementation Section, for assistance with applicability of the "web coating line" definition from subpart JJJJ to the Paper Coating Operations equipment. As a result, it was determined that the Resin Kitchen, Saturator Wind-up Station, and Unwind Station are not included by the "web coating line" definition, and therefore, **are not** subject to subpart JJJJ. It was also determined that the Mull Rack is included by the "web coating line" definition, and therefore **is** subject to JJJJ (Ahlstrom representatives received a similar response from Paul Almodovar, U.S. EPA Research Triangle Park, who served as primary author for subpart JJJJ). As a result, if the Resin Kitchen, Saturator Wind-up Station, and Unwind Station emissions*

*are not factored into the MACT compliance demonstration, then demonstrating compliance with the MACT may or may not demonstrate compliance with 61:120. Using this method to demonstrate compliance with 61:120 would depend upon the exact amount of emissions from the Resin Kitchen, Saturator Wind-up Station, and Unwind Station and the rest of the Paper Coating Operations. Therefore, judging whether accepting compliance with the MACT standard is also a demonstration of compliance with 61:120 should not be done until after the new testing and emissions evaluations are conducted.*

**EMISSION AND OPERATING CAPS DESCRIPTION:**

See the permit for specific Operating Limitations and Emission Limitations, by group.

**PERIODIC MONITORING:**

See the permit for Specific Monitoring Requirements, by group.



APPENDIX A

ASSUMPTIONS AND CORRECTIONS FOR SCREEN3  
MODELING

## Appendix A

### Assumptions and Corrections for SCREEN3 Modeling

- Since SCREEN3 models a single emission source, all emissions were assumed to go through the Reeco Thermal Oxidizer stack. This assumption produces less conservative results because some of the actual air-toxics emissions are fugitive and would have a lower emission height and lower emission velocity than from a stack.
- Since the exact locations of the stacks, and the exact locations and heights of surrounding buildings were not known, it was assumed that building downwash was not a factor. In reality it might not be, but if it is, this assumption produces less conservative results because if building downwash was calculated, it could result in higher concentrations in the vicinity of the buildings.
- 100% capture efficiency was assumed for each process that is vented to the Reeco Thermal Oxidizer. The source needs to verify the capture efficiency of each capture device in the emissions capture system.
- For formaldehyde modeling Run 2, 50% formaldehyde retention in the coating was assumed (See Appendix B).
- For formaldehyde modeling Run 3, 93.2% formaldehyde retention in the coating was assumed (See Appendix B).
- The emission calculations in the application were adjusted from 7200 hours of operation (i.e.: the 1998 production hours) to 8760 hours (i.e.: the maximum annual hours of coating operations requested in additional information).
- The adjusted emissions were converted to grams/second for input to the model.
- All 1-hr concentration modeled results were multiplied by .08 in order to adjust them to annual concentrations for comparison to PRG values.

APPENDIX B

EMISSION RATE DEVELOPMENT FOR SCREEN3  
MODELING

## Appendix B

### Emission Rate Development for SCREEN3 Modeling

- **Formaldehyde, 1.19 g/sec (Run 1).** This emission rate was determined by converting the source-wide controlled potential emissions of formaldehyde from the Pollutants of Concern (POC) table, 41.22 tpy, to grams per second.

$$41.22 \text{ tpy} * 2000 \text{ lb/ton} * 453.6 \text{ g/lb} \div 8760 \text{ hr/yr} \div 3600 \text{ sec/hr} = \underline{1.19 \text{ g/sec}}$$

- **Formaldehyde, 0.6 g/sec (Run 2).** This emission rate was determined by assuming that 50% of the formaldehyde is retained in the coating. This assumption is based on a letter from Ashland Chemical included with a Toxic Air Pollutant Emissions Survey conducted for the source by Pacific Environmental Services, Inc. on November 11, 1987. The survey was included with the application associated with permit O-88-066.

- Uncontrolled emissions from Paper Coating Operations from the POC table = 81.59 tpy
- Emissions from fugitive sources from the POC table = 0.5 tpy

$$81.59 \text{ tpy} * (1 - 0.5) = 40.795 \text{ tpy} \text{ (Emissions reduced by 50\% coating retention)}$$

$$40.795 \text{ tpy} * (1 - 0.5009) = 20.36 \text{ tpy} \text{ (Emissions reduced by 50.09\% destruction efficiency)}$$

$$20.36 \text{ tpy} + 0.5 \text{ tpy} = 20.86 \text{ tpy} \text{ (Paper Coating Emissions + Fugitives)}$$

$$20.86 \text{ tpy} * 2000 \text{ lb/ton} * 453.6 \text{ g/lb} \div 8760 \text{ hr/yr} \div 3600 \text{ sec/hr} = \underline{0.6 \text{ g/sec}}$$

- **Formaldehyde, 0.09 g/sec (Run 3).** This emission rate was determined by assuming that 93.2% of the formaldehyde is retained in the coating. This coating retention rate was determined by setting up a material balance equation.

- $\text{Form}_{\text{in}}$  = Formaldehyde process input from POC Table = 82.06 tpy
- $\text{Form}_{\text{out}} = \text{Form}_{\text{ric}} + \text{Form}_{\text{fug}} + \text{Form}_{\text{t.o.}}$
- $\text{Form}_{\text{ric}}$  = Formaldehyde retained in coating
- $\text{Form}_{\text{fug}}$  = Formaldehyde Emissions from fugitive sources from the POC table = 0.5 tpy
- $\text{Form}_{\text{t.o.}}$  = Formaldehyde input to the Thermal Oxidizer from Table 2-3 of thermal oxidizer stack test results included with application = 1.162 lb/hr = 5.09 tpy  
( $1.162 \text{ lb/hr} * 8760 \text{ hr/yr} \div 2000 \text{ lb/ton} = 5.09 \text{ tpy}$ )

$$\text{Form}_{\text{in}} = \text{Form}_{\text{out}} = \text{Form}_{\text{ric}} + \text{Form}_{\text{fug}} + \text{Form}_{\text{t.o.}}$$

$$\text{Form}_{\text{ric}} = \text{Form}_{\text{in}} - \text{Form}_{\text{fug}} - \text{Form}_{\text{t.o.}} \text{ (Equation rewritten)}$$

$$\text{Form}_{\text{ric}} = 82.06 \text{ tpy} - 0.5 \text{ tpy} - 5.09 \text{ tpy} = 76.47 \text{ tpy}$$

$$76.47 \text{ tpy} \div 82.06 \text{ tpy} = 0.932 * 100\% = 93.2 \%$$

- **Formaldehyde, 0.09 g/sec (Run 3)** (Calculations continued)

- Uncontrolled emissions from Paper Coating Operations from the POC table = 81.59 tpy
- Emissions from fugitive sources from the POC table = 0.5 tpy

$$81.59 \text{ tpy} * (1 - 0.932) = 5.55 \text{ tpy} \text{ (Emissions reduced by 93.2\% coating retention)}$$

$$5.55 \text{ tpy} * (1 - 0.5009) = 2.77 \text{ tpy} \text{ (Emissions reduced by 50.09\% destruction efficiency)}$$

$$2.77 \text{ tpy} + 0.5 \text{ tpy} = 3.27 \text{ tpy} \text{ (Paper Coating Emissions + Fugitives)}$$

$$3.27 \text{ tpy} * 2000 \text{ lb/ton} * 453.6 \text{ g/lb} \div 8760 \text{ hr/yr} \div 3600 \text{ sec/hr} = \underline{0.09 \text{ g/sec}}$$

- **Methanol, 14.91 g/sec.** This emission rate was determined by converting the source-wide controlled potential emissions of methanol from the Pollutants of Concern (POC) table, 518.27 tpy, to grams per second.

$$518.27 \text{ tpy} * 2000 \text{ lb/ton} * 453.6 \text{ g/lb} \div 8760 \text{ hr/yr} \div 3600 \text{ sec/hr} = \underline{14.91 \text{ g/sec}}$$

- **Phenol, 0.53 g/sec.** This emission rate was determined by converting the source-wide controlled potential emissions of phenol from the Pollutants of Concern (POC) table, 18.39 tpy, to grams per second.

$$18.39 \text{ tpy} * 2000 \text{ lb/ton} * 453.6 \text{ g/lb} \div 8760 \text{ hr/yr} \div 3600 \text{ sec/hr} = \underline{0.53 \text{ g/sec}}$$

- **Triethylamine, 0.26 g/sec.** This emission rate was determined by converting the source-wide controlled potential emissions of triethylamine from the Pollutants of Concern (POC) table, 8.95 tpy, to grams per second.

$$8.95 \text{ tpy} * 2000 \text{ lb/ton} * 453.6 \text{ g/lb} \div 8760 \text{ hr/yr} \div 3600 \text{ sec/hr} = \underline{0.26 \text{ g/sec}}$$

APPENDIX C

SCREEN3 MODELING PRINT-OUTS

APPENDIX D

U.S. EPA REGION IX PRG VALUE TABLES